

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1-12 (cancelled)

13. (currently amended) Recombinantly produced, isolated and purified lipidated PsaA protein produced by ~~the process of claim 7a~~ a process comprising the steps of:
constructing a hybrid nucleic acid molecule comprising a first nucleic acid sequence encoding a signal sequence of a Borrelia lipoprotein and a second nucleic acid sequence encoding a mature PsaA protein, or fragment thereof, wherein the first nucleic acid sequence is contiguous with the second nucleic acid sequence; forming an expression vector containing the hybrid nucleic acid molecule operatively linked to a promoter for expression of the mature protein; introducing the expression vector into a host organism; effecting expression of the recombinant lipidated PsaA protein by the host organism; lysing the cells of the host organism; treating the lysed cells with a surfactant which selectively solubilizes the recombinant lipoprotein in preference to bacterial and other proteins and which is able to effect phase separation of a detergent phase under mild conditions; effecting phase separation at a detergent phase containing solubilized recombinant lipidated PsaA protein, an aqueous phase containing bacterial and other proteins and a solid phase containing cell residue; separating and recovering the detergent phase from the solid phase and the aqueous phase; contacting the detergent phase with a first chromatographic column under conditions which result in binding of protein other

than the recombinant lipidated PsaA protein to the column to provide a flow-through containing lipidated PsaA protein from the first chromatographic column and recovering the flow-through from the first chromatographic column; contacting the flow-through from the first chromatographic column with a second chromatographic column under conditions which result in binding of the recombinant lipidated PsaA protein in preference to contaminant proteins and lipopolysaccharides which flow through the second chromatographic column; eluting the recombinant lipidated PsaA protein from the second chromatographic column to provide an eluant substantially free from lipopolysaccharides and contaminant proteins; and recovering the eluant.

14. Recombinantly produced, isolated and purified lipidated PsaA protein ~~having a purity of at least 80% and~~ substantially free from contaminant proteins and lipopolysaccharides.
15. The recombinantly produced, lipidated PsaA protein of claim ~~14~~13, wherein said protein has a purity of at least 95%.
16. An immunological composition comprising the recombinant lipidated PsaA protein of claim 15.
17. The immunological composition of claim 16, further comprising an adjuvant.
18. The immunological composition of claim 17, wherein the adjuvant is alum.
19. A method of inducing an immunological response in an animal comprising the step of administering to the animal the immunological composition of claim 16.
20. A method of immunizing a host against pneumococcal infection, which method comprises administering to the host an immunologically effective amount of

recombinantly produced, lipidated PsaA.

21. The method of claim 20, wherein said administration is effected intranasally.
22. An immunogenic composition for intranasal administration to a host susceptible to pneumococcal carriage to elicit a protective immunological response against colonization with *Streptococcus pneumoniae* in the ~~nasopharynx~~ nasopharynx, which comprises an immunizing amount of recombinant lipidated PsaA, or an immunogenic fragment thereof.
23. The composition of claim 22, further comprising an adjuvant.
24. The composition of claim 23, wherein the adjuvant is alum.
25. (new) A recombinant lipidated PsaA protein encoded by a hybrid nucleic acid molecule comprising a first nucleic acid sequence encoding a signal sequence of a lipoprotein other than PsaA and a second nucleic acid sequence encoding a mature PsaA protein, or immunogenic fragment thereof, wherein the first nucleic acid sequence is contiguous with the second nucleic acid sequence.
26. (new) The recombinant lipidated PsaA protein of claim 25, wherein the signal sequence is the signal sequence of an OspA protein of a *Borrelia* species.
27. (new) The recombinant lipidated PsaA protein of claim 25, wherein the lipidated PsaA is produced in a high five cell.
28. (new) The method of claim 20, wherein the lipidated PsaA is recombinantly produced in a high five cell.
29. (new) The immunogenic composition of claim 22, wherein the lipidated PsaA is recombinantly produced in a high five cell.